

Chapter 7 – SIDRA Analysis

Use of the SIDRA (version 5.20b) computer program allowed the comparison of the roundabout and traditional intersections under a number of varying traffic flow and control conditions.

Other researchers have performed computer analysis of operation of roundabouts. Savage (1994) reported on a comparison of capacities for roundabouts versus two-way STOP controlled intersections (12). The evaluation used the Highway Capacity Manual (HCM) (8) for determining operations at the STOP controlled intersections and a method developed by Troutbeck for the roundabouts. In all cases, operation of the roundabouts was better than the two-way STOP controlled intersections under similar traffic conditions (12).

SIDRA was used to evaluate the operation at the Candlewood Drive/ Gary Avenue roundabout. This model evaluates the operation using gap acceptance theories accepted by the Australian Road Authority and similar to those adopted for use by the HCM software. Competing computer models (RODEL and ARCADY) both use British empirical formulas for evaluating roundabout operation. There is some question as to the validity of the gap acceptance model at near capacity conditions (defined by SIDRA as $v/c \geq 0.85$). Since this study examined a low volume roundabout, the capacity issues surrounding gap acceptance theory near capacity do not apply.

SIDRA was installed to operate on the HCM methodology with vehicles driving on the right. The SIDRA software allows the user to choose the side of the road the traffic drives on as it is used throughout the world. Queue lengths were calculated using a vehicle length of 7.6 meters (25 feet). The Candlewood Drive/ Gary Avenue geometric features required for SIDRA were based on measurements taken from the construction plans. Sample results of the SIDRA analysis of the roundabout are provided in Appendices 3, 4 and 5. While SIDRA can provide a number of output measures, only those output values relating to the study measures of effectiveness are included in this report.